

IN THE CLAIMS:

The following listing of claims will replace all prior listings of claims in the application:

1. (Currently Amended): A method for synchronizing divergent graphics samples included in a group of data samples processed in a programmable graphics processing unit, the method comprising:

executing each instruction of an instruction sequence simultaneously on each sample of the group;

determining that a divergence has occurred between a subset of the samples in the group, whereby a call/return operation is executed on the subset of the samples of the group;

detecting that a first sample of the subset of samples has encountered a first synch token;

determining whether any of the other samples of the subset has encountered a synch token;

determining whether the synch token encountered by any of the other samples of the subset is the first synch token;_and

synchronizing the subset of samples with the other samples of the group for processing a next instruction in the instruction sequence only if all the samples of the subset have encountered the first synch token.

2. (Previously Presented): The method of claim 1, further comprising the step of initiating a time out when the first sample of the subset encounters the first synch token; and

processing the next instruction in the instruction sequence only if all the samples of the subset encounter the first synch token within a defined time period.

3. - 5. (Cancelled)

6. (Original): The method of claim 1, further comprising the step of initiating termination steps if the synch token encountered by any of the other samples in the group is not the first synch token.
7. (Cancelled)
8. (Previously Presented): The method of claim 2, further comprising the step of holding the first sample idle once the first sample has encountered the first synch token until the time out period elapses.
9. (Original): The method of claim 1, wherein determining that a divergence has occurred comprises determining that a first program counter of a plurality of program counters is different than a second program counter of the plurality of program counters, each program counter of the plurality of program counters corresponding to a different one of the samples of the group of samples.
10. (Original): The method of claim 9, wherein the first program counter being different than the second program counter results from a conditional branch or a jump.
11. (Original): The method of claim 1, wherein determining that a divergence has occurred comprises determining that a first subroutine depth of a plurality of subroutine depths is different than a second subroutine depth of the plurality of subroutine depths, each subroutine depth of the plurality of subroutine depths corresponding to a different one of the samples of the group of samples.
12. (Original): The method of claim 11, wherein the first subroutine depth being different than the second subroutine depth results from a call-return.
13. - 23. (Cancelled)

24. (Previously Presented): A system for synchronizing divergent graphics samples included in a group of data samples processed in a programmable graphics processing unit, the system comprising:

means for simultaneously executing each instruction of an instruction sequence on each sample of the group of samples,

means for determining that a divergence has occurred between a subset of the samples in the group, whereby a call/return operation is executed on the subset of the samples of the group;

means for detecting that a first sample of a subset of samples has encountered a first synch token;

means for determining whether each of the other samples of the subset has encountered a synch token;

means for determining whether the synch token encountered by each of the other samples in the subset is the first synch token; and

means for synchronizing the subset of samples with the other samples of the group for processing a next instruction in the instruction sequence only if all the samples of the subset have encountered the first synch token.

25. (Original): The system of claim 24, further comprising means for processing the group of samples in non-divergent mode if the synch token encountered by each of the other samples in the group is the first synch token.

26. (Previously Presented): The method of claim 1, wherein determining whether divergence has occurred includes corresponding the program counters (PC) of threads assigned to the samples, and if the samples of the group do not all have the same PC then divergence has occurred, and if the samples of the group all have the same PC then synchronous processing continues.

27. (Previously Presented): The method of claim 1, including holding idle the samples of the group on which the call/return is not executed.